**Policy Statement**

MetaNeb™ is a therapeutic device that utilizes a systematic approach to enhance normal mucous clearance and resolve or prevent patchy atelectasis. Initiation of the MetaNeb™ System will be determined as outlined in the Therapist Driven Protocols.

**Purpose of Policy**

To provide guidelines for the appropriate initiation of the MetaNeb™ System.

**Indications**

The MetaNeb™ System is indicated when mobilization of secretions, lung expansion and treatment and prevention of pulmonary atelectasis is indicated.

**Contraindications**

<table>
<thead>
<tr>
<th>Absolute</th>
<th>Possible Adverse Reactions</th>
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<tr>
<td>Untreated tension pneumothorax</td>
<td>Hyperventilation</td>
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<td></td>
<td>Gastric distension</td>
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<td></td>
<td>Decreased cardiac output</td>
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<td>Relative</td>
<td>Increased intracranial pressure</td>
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<td>History of pneumothorax</td>
<td>Increased air trapping</td>
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<td>Pulmonary air leak</td>
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<td>Recent pneumonectomy</td>
<td>Pneumothorax</td>
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<td>Pulmonary hemorrhage</td>
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<td>Myocardial infarction</td>
<td>Pulmonary hemorrhage</td>
</tr>
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<td>Vomiting</td>
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</tbody>
</table>

**MetaNeb™ Modes of Therapy**

- CHFO (Continuous High Frequency Oscillation) – a pneumatic form of chest physiotherapy that delivers medicated aerosol while oscillating the airways with continuous pulses of positive pressure.
- CPEP (Continuous Positive Expiratory Pressure) – supplies medicated aerosol combined with continuous positive pressure to help hold open and expand the airways.
- Aerosol – for the delivery of aerosol only. In this mode CHFO and CPEP are not available.
(C) Procedure

After checking physician order, or as indicated based on Respiratory Assessor findings following the “Respiratory Therapy to Evaluate and Treat” per protocol order, the RCP will assemble the unit in accordance with directions included with the device.

Assembly of Circuit

1. Put the circuit tri-connector/bio-filter into the tri-connector port on the control unit.
2. Turn the connector 45° counterclockwise to lock it into position.
3. Attach the mouthpiece to the handset: insert the mouthpiece at a 45° angle and gently push it in and twist it to the correct orientation.
4. Remove the nebulizer from the package.
5. Assemble the nebulizer and add the prescribed medication.
6. Connect the nebulizer to the nebulizer port on the bottom of the handset.
7. Connect, but do not twist, the nebulizer hose of the tubing to the bottom of the nebulizer. Make sure to push the bushing all the way on to the nebulizer stem.

Add Medication to the Nebulizer

1. Remove the container cap from the nebulizer.
2. If the green cone is not already installed, put the green cone into the container.
3. Fill the container with the prescribed medication. The minimum capacity of the nebulizer is 1 ml and the maximum capacity is 5 ml.
4. Install and tighten the container cap on to the container. Make sure the green cone in the container stays in position.

PRE-USE CHECK – Perform before each use:

Non-ventilator patient – Pre-Use Check

1. Connect the gas hose to a 50 psi oxygen source.
2. Connect the circuit to the controller.
3. Set the mode to CHFO, and select Higher.
4. Set the selector ring on the handset to the three-dot position.
5. Put the master switch in the ON position.
6. Occlude the patient opening of the handset.
7. Watch the pressure gauge. The average of pressure fluctuations should not be less than 15 and not more than 30 cmH2O.
8. Set the mode to CPEP.
9. Turn the CPEP flow dial counterclockwise to **full flow**.

10. With the selector ring on three dots, occlude the patient opening of the handset and monitor the manometer. Make sure there is a peak pressure occurrence of not less than 20 and not more than 30 cmH2O.

11. If the device is not within the parameters specified above, do not use the unit. Fill out and attach a Biomed equipment repair tag and return the defective unit to the Respiratory Care Department.

**Ventilator patient – Pre-Use Check**

1. Connect the gas hose to a 50 psi oxygen source.
2. Connect the circuit to the controller.
3. Set the mode to **CHFO**, and select **Higher**.
4. Put the master switch in the **ON** position.
5. Occlude the patient opening of the handset.
6. Watch the pressure gauge. The average of pressure fluctuations should not be less than 15 and not more than 40 cmH2O.
7. Set the mode to **CPEP**.
8. Turn the CPEP flow dial counterclockwise to **full flow**.
9. With the black occlusion ring installed, occlude the patient opening of the handset and monitor the manometer. Make sure there is a peak pressure occurrence of not less than 20 and not more than 45 cmH2O.
10. If the device is not within the parameters specified above, do not use the unit. Fill out and attach a Biomed equipment repair tag and return the defective unit to the Respiratory Care Department.

**TREATMENT PROTOCOL – Non-ventilator patient**

1. Make sure the unit operates as outlined above in Pre-Use Check for non-ventilator patient.
2. Follow appropriate infection control guidelines.
3. Introduce yourself, and explain the procedure to the patient.
4. The patient should be in an upright and comfortable position, if possible.
5. The patient should be assessed prior to initiation of therapy.
6. Fill the nebulizer with the prescribed medications, if applicable.
7. Set the mode to **CPEP**.
8. Turn the CPEP flow dial all the way clockwise to the **lowest** position.
9. Set the selector ring on the handset to the **one-dot** position.
10. Connect the MetaNeb™ System to a 50 psi oxygen source.
11. Put the master switch in the **ON** position.
12. Adjust the CPEP flow to observe the aerosol that comes from the patient end of the handset.
13. Attach the mouthpiece to the handset.
NOTE: A cushion mask or tracheotomy tube may also be connected to the handset using the appropriate provided adapter.

14. Instruct the patient to inhale normally and exhale slowly (3-4 seconds) through the mouthpiece or facemask.

15. Adjust the selector ring up to the two-dot setting for higher resistance or three-dot setting for the highest resistance as tolerated by the patient.

16. Encourage the patient to exhale slowly (3-4 seconds).

17. Continue CPEP mode approximately 2 ½ minutes, adjusting the flow to achieve a therapy that is comfortable yet challenging for the patient.

18. Instruct the patient that the mode will now change to CHFO. Proceed with changing the mode to CHFO.

19. Move the Higher/Lower switch to Higher.

20. During the treatment, the selector ring may be adjusted and the Higher/Lower switch may be moved to Lower.

   NOTE: the Lower setting on the Higher/Lower switch reduces the percussion rate and the pressure, and may be used as an introductory therapy.

21. Encourage the patient to inhale normally and exhale slowly (3-4 seconds) against pulsations, keeping his or her cheeks firm to avoid pressure loss.

22. Continue CHFO mode for approximately 2 ½ minutes.

23. Alternate between CPEP and CHFO for 10 minutes or depending on patient need or as otherwise tolerated.

TREATMENT PROTOCOL – Ventilated Patient

1. Make sure the unit operates as outlined above in Pre-Use Check for ventilator patient.

2. Follow appropriate infection control guidelines.

3. Introduce yourself, and explain the procedure to the patient.

4. Make a note of the current ventilator alarm and mode settings.

5. The patient should be in a position to maintain the head of the bed angle at > 30 degrees if possible.

6. The patient should be assessed prior to initiation of therapy.

7. Prepare the handset for in-line use as follows:
   a. Remove the selector ring from the patient end of the handset.
   b. Install the black occlusion ring to make sure the exhalation orifice is blocked.
   c. Use the adapter (15 mm x 22 mm) to connect the handset to the spring-valve tee adapter.

8. Fill the nebulizer with the prescribed medications, if applicable.

9. Connect the MetaNeb™ System to a 50 psi oxygen source.

10. Set the mode to CHFO and select Higher.

   NOTE: There is no need for CPEP as this therapy can be accomplished with the ventilator.
11. Put the master switch in the **ON** position.

12. Put a spring-valve “tee” adapter into the inspiratory limb of the ventilator circuit.

13. Monitor the patient response to the therapy and continue the treatment for 10 minutes.

   **NOTE:** As secretions mobilize, it is not uncommon for plugs to momentarily occlude the upper airways. Do not leave the patient during the therapy and be prepared to suction.

14. Adjust the alarm parameters as necessary while in-line therapy is performed.

   **NOTE:** The MetaNeb™ will introduce additional flow into the circuit and may distort readings. Alarm limits will likely need to be temporarily adjusted in order to avoid nuisance alarms.

15. Suction secretions as necessary during the treatment.

16. Once therapy is completed, remove the handset and adapter from the spring-valve tee and cap the spring-valve tee before you put the MetaNeb™ System master switch in the **OFF** position.

17. Return the ventilator alarms and mode to their previous settings.


**Storage of Equipment**

When the treatment has been completed, turn the machine off and disconnect the circuit keeping the tubing attached to the bottom of the nebulizer cup and disassemble the top of the nebulizer from the handset. Rinse the nebulizer cup and store the circuit in a clean patient setup bag.